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PROGRESS OF DUTCH ELM DISEASE ERADICATION

R. P. White

[The following paragraphs are quoted from the October number of "Nursery Disease Notes" (mimeographed) published by the Department of Plant Pathology of the New Jersey Agricultural Experiment Station.]

From time to time it is proper that we inform ourselves as to the status of disease control projects within the State. The outstanding control and eradication effort at the present time is the Dutch elm disease project. Few people realize the magnitude of the work already done or contemplated for the immediate future.

The disease had been present in the Metropolitan area of New York a few years before its discovery in New Jersey in 1933. In 1934 the limits of the disease in this area had been pretty well defined by organized scouting and these limits were stated to be a zone fifty miles from Columbus Circle, taking in most of northern Jersey, Rockland and Westchester Counties in New York and Fairfield County in Connecticut. This area has not been extended in 1935--an important matter. New finds of diseased trees in Hunterdon and Sussex Counties in New Jersey and in Putnam County in New York merely rounded out this fifty mile zone.

The objective of the project relative to the Dutch elm disease has been well stated by those in charge as "the immediate control and ultimate eradication of the Dutch elm disease in the United States." The data would indicate conclusively that the first portion of this objective has already been accomplished. It has been established beyond reasonable doubt, that the disease, if left unchecked in this fifty mile area, would increase approximately six-fold per year. From the record we find that instead of 600 per cent increase in the number of diseased trees we have on the average no increase, and in some areas an actual decrease. This is certainly justification for continuing actively and vigorously until the entire objective has been attained. With such progress in the face of serious handicaps in the allotment and availability of funds, great progress and ultimate success are sure to follow if obstacles are not thrown in the path. Those of us who have lost one or more beautiful trees from our properties, know only too well the magnitude of our bereavement, and the quicker the program is concluded the greater the saving.

* * *

The disease was imported into the United States on elm burl logs through several ports. These logs with the European elm bark beetle under the bark, the known carrier of the fungus from tree to tree, traveled over several railroads on open cars to several veneer manufacturing plants in as many midwestern cities. Due to these importations fourteen areas have been exposed to the disease, in six of which diseased trees have been found. The results of the work already accomplished in three of these, namely, Cleveland where the first tree was found in 1930, Cincinnati and Baltimore, are distinctly favorable to complete eradication. In addition to the major work area, the fifty mile zone about New York, scouting must be done around the ports of entry of these veneer logs, about five railroads leading from Atlanta, three from New Orleans and others from New York to veneer plants in the midwest, and about these plants. Over 12,000 miles of railroad must be scouted for the disease, for a single escaped beetle, if carrying the fungus, might initiate a new center of infection.

The major work area, as I have indicated, lies in the fifty mile zone about New York. The fifty mile zone encompasses three States, twenty-six counties, one hundred sixty-nine townships and four hundred forty-seven cities, towns and villages.

* * *

There are at least 25,000,000 elms in this area, 50 per cent of which are small seedlings, brush or swamp elms of no value. Half of the remainder are elms standing in woods and fields with timber value only.

There are left about 6,000,000 elms over 15 feet high, many of which are magnificent specimens 80 to 100 feet high which are shade or ornamental trees. The value of these trees to real estate alone is a staggering figure. All this is within 50 miles of New York City. The elms of New England and the rest of the country are threatened as well, although not immediately, of course. However, if this eradication program is allowed to lapse, they are just as certainly in danger as the elms near New York.

That the elms of areas distant from the present work area are not threatened immediately is due to several factors. In the first place, Plant Quarantine #70 as amended, prohibits further importation of elm burl logs from Europe, where the disease is beyond control. Second, Plant Quarantine #71 prohibits the movement of elm trees or living elm wood from the major infected area to points outside the area; third, the smaller European elm bark beetle is a weak flyer and cannot be expected to travel under its own power any great distance, though isolated individuals may be carried by the wind for some distance. Fourth, the concentration of the disease is within the inner limits of this fifty mile area, not on the margins. In the zone between the 10 and 15 mile line from Columbus Circle, ten diseased elms have been found per square mile, in the 20-25 mile zone, three, and in the 30-35 mile zone, only one for every two square miles, and in the outer zone of 45-50 miles, only one tree in every 250 square miles. The finding of these single isolated trees in the outer limits of spread of the disease speaks well for the ability of the scouts; their prompt removal will effectively prevent further spread.

* * *

One of the most important factors which has brought about this very definite progress in the entire campaign is the sanitation program which was conducted last winter and which will be continued this winter. This sanitation program has as its object the removal of all dead and dying elms, not only in settled areas but also in the woodlands. Last winter in removing such trees it was found that an appreciable percentage of them were infected with the Dutch elm disease. In addition to this fact, a larger percentage of them were heavily infested with the European elm bark beetle which spreads the fungus from tree to tree during the summer months. Hundreds of thousands of such worthless trees were removed last year and it is estimated that there still remains approximately 500,000 of such menacing individuals to be removed this winter. This sanitation program not only reduces the number of standing infected trees but also reduces the population of the bark beetle. The removal of such trees is good silvicultural practice in wooded areas. The elm is not a desirable timber tree and its removal allows other desirable trees such as the chestnut oak, ash, etc, to grow up. With the removal of the additional 500,000 trees which are dead and dying, this winter, the entire fifty mile

area will be completely sanitated. This will, without any question, further aid in the reduction of the spread of this disease and go far toward complete eradication.

CURRENT INFORMATION ON DUTCH ELM DISEASE

(From reports of the Bureau of Entomology and Plant Quarantine for the weeks ending September 28 and October 5)

During the period Dutch elm disease was confirmed in one tree at Brunswick, Maryland, an important railroad center about 50 miles from Baltimore.

The number of confirmed and eradicated trees up to October 8 is as follows:

	Confirmed	Removed
Connecticut		
September 22 to October 8	0	5
Total up to October 8	131	131
New Jersey		
September 22 to October 8	314	514
Total up to October 8	8,927	8,576
New York		
September 22 to October 8	33	185
Total up to October 8	4,737	4,702
Other		
September 22 to October 8	1	2
Total up to October 8	16	16
Totals		
September 22 to October 8	348	706
Total up to October 8	13,811	13,425

LEAF BLIGHT ON OAK IN OREGON

S. M. Zeller sent a specimen of *Gnomonia veneta* on *Quercus kelloggii* collected at Medford in July, with the following comment:

"Trees of this species were very severely blighted. *Quercus kelloggii* was planted alternately with another, resistant, species, perhaps *Q. garryana*. Both sides of the highway to Jacksonville were strikingly arrayed with the alternate blighted trees. The native

Garry oaks in neighboring fields were not infected. There were extremely few twig cankers. Such blight is rare in this locality but the unusual rains of spring and early summer doubtless accounts for this year's infection."

HERBACEOUS ORNAMENTALS HEAVILY INFESTED BY HETERODERA MARIONI (CORNU) GOODEY

G. H. Godfrey

Following is a list of ornamentals that I know, from personal observation, to be highly susceptible to attack by the root-knot nematode. The localities are not complete. It would be desirable to have similar lists from other sources, indicating relative susceptibility, locality, and where possible the variety of the host.

ANTIRRHINUM MAJUS	Snapdragon	Berkeley and in Southern California Honolulu, Hawaii
AQUILEGIA SP.	Columbine	
BEGONIA SP.	Begonia	Berkeley, California Hawaii
CALENDULA SP.	Calendula	Hawaii
CLEMATIS SPP.	Clematis	
COLEUS BLUMEI	Coleus	California Hawaii
DAHLIA SP.	Dahlia	
DIANTHUS CARYOPHYLLUS	Carnation	General
FREESIA SP.	Freesia	
FUCHSIA SP.	Fuchsia	
GERBERA SP.	Gerbera, African daisy	Florida, California, Hawaii
KNIPHOFIA SP.	Tritoma, poker plant	Los Angeles County, California
OXALIS MARTIANA	Oxalis	Hawaii
PETUNIA HYBRIDA	Petunia	Berkeley, California Hawaii
POLYANTHES TUBEROSA	Tuberose	North Carolina, Texas.
PAEONIA SP.	Peony	
TROPAEOLUM MAJUS	Nasturtium	Hawaii
VIOLA SP.	Violet	Florida, California, Hawaii
VIOLA TRICOLOR	Pansy	Hawaii

SOME NOTES ON FUNGI CAUSING DISEASES OF CABBAGE AND OTHER CRUCIFERS

Charles Chupp and P. P. Pirone

Cercospora albo-maculans, Ell. and Ev. In 1894 Ellis and Everhart (Proc. Acad. Nat. Sci. Phila.) described Cercospora albo-maculans on Brassica campestris, but stated that the conidiophores were hyaline. On this basis, Saccardo referred it to Cercosporella. The type material also shows it to be a Cercosporella, as has already been pointed out by W. H. Davis (Phytopath. 17: 669-670. 1927). On September 28, 1935, material was obtained from Suffolk County, Long Island, in which the leaves of Chinese cabbage were covered thickly with the circular to subcircular, pale tan to grayish spots so characteristic of the Cercosporella. When mounts were made, the conidia were identical with those for the type material of Cercospora albo-maculans, but the conidiophores had distinct color, as is true for Cercospora. A specimen on turnip collected by Hesler in 1919 at Long Beach, Mississippi, showed similar coloring of the conidiophores when mounts were made. Therefore, it would seem this fungus on the crucifers is similar to certain other Cercosporae, such as C. rosae (Fuckel) v. Höhnel and C. pyri Farlow which at times may have distinctly colored conidiophores and at other times be perfectly hyaline, or have intervening gradations with some of the fascicles showing both colored and hyaline fruiting stalks.

Macrosporium herculeum, Ell. & Mart. In examining leaf spots on cabbage during the late growing period of 1935, it was found that the fungus involved was more frequently Macrosporium herculeum than M. brassicae Berk. which has been considered the common species. The spots of the former generally are not large, but in the cases observed, are numerous and apparently can be distinguished from M. brassicae for these reasons. The two can readily be separated by means of a microscopic examination.

In 1884 Peck (Ann. Rept. N. Y. State Mus. 35: 140) described Cercospora lepidii on Lepidium. The type material shows the fruiting to be that of M. herculeum. The same is true of Sydow's Mycotheca Marchiva No. 3087, and labeled Cercospora bizzozzeriana Pass. on Lepidium. The material was examined both at the New York Botanical Gardens, and at the Harvard Crypotogamic Herbarium. (New York Agricultural Experiment Station, Ithaca, October 1).

DISEASES OF VEGETABLE CROPS IN GEORGIA

J. H. Miller

ARTICHOKE: In two small adjacent fields in Clarke County powdery mildew (Erysiphe cichoracearum) is very severe in October on Red Jerusalem artichoke, but there is very little on White Jerusalem, while Puccinia helianthi is severe on the latter with almost none on the former.

ASPARAGUS: Stem blight (Cercospora caulicola) was serious on stems in August and September in a Clarke County field. It did not injure the market crop but may affect food storage in roots for another year.

BEANS: Bacterial blight (Bacterium phaseoli) practically ruined a five-acre field of snap beans near Moultrie in late May. This disease has often been severe in south Georgia, but rarely occurs in the bean fields of the mountain valleys.

Root rot (Fusarium martii phaseoli) was recovered from dying snap beans in an Atlanta garden in May.

Mosaic was observed in three fields near Macon in June. Fifteen to twenty per cent of the plants were diseased.

LIMA BEANS: Blight (Bacterium phaseoli) was found on rotting beans in the Athens market in July. About 25 per cent in one lot had to be discarded. These were grown near Valdosta. It was also found on specimens sent in from Hartfield.

Pod blight (Diaporthe phaseolorum) and anthracnose (Colletotrichum truncatum) were found on lima beans sent in from Hartfield.

CABBAGE: Downy mildew (Peronospora parasitica). Fairly heavy infestation occurred on the underside of leaves of a Golden variety on the Horticultural Farm during March. The disease was not serious and disappeared with advent of hot weather.

Cabbage yellows (Fusarium conglutinans) was found on Late Flat Dutch and Late Drumhead on the same farm during early spring. This disease is still severe in the mountain section, but the present use of resistant varieties is greatly reducing the damage. According to reports from farmers it appeared in Union, Lumpkin and Towns Counties for the first time about eight years ago.

CARROTS: Southern blight (Sclerotium rolfsii) destroyed about 10 per cent of a small field on the Horticultural Farm in July. Root-knot (Heterodera marioni) was found on almost all of the carrots in this field in spite of the rather stiff red Cecil clay soil.

COLLARDS: Softrot of the stem (Sclerotinia sclerotiorum) destroyed 18.6 per cent of a half-acre field on the Horticultural Farm in April. The stems rotted about six inches from the ground, and a mass of sclerotia formed in each at this point. After this disintegration the tops died, most of them toppling over. With hot weather in May the disease stopped spreading and the surviving plants matured seed.

ENDIVE: Drop (Sclerotinia sclerotiorum) destroyed about 10 per cent of the plants in a small field on the Horticultural Farm in March. Both broad and narrow leaved varieties were affected equally.

ONION, ETC.: Soft rot (Bacillus carotovorus). There was a very heavy infestation on the Horticultural Farm in May. The varieties with percentage losses are given below.

Variety	Per Cent Loss	Variety	Per Cent Loss
ONION		LEEK	
Ebenezer	7.	Large London Play	1.1
Mammoth Silver King	8.1	Carantan	1.9
Riverside Sweet Spanish	9.6	Musselberg	4.5
Gigantic Gibraltar	11.		
Prize Taker	11.7	GARLIC	
Copper King	13.	Italian	62.1
Silver Skin	13.8		
Yellow Globe Danvers	13.9		
Large Red Weatherfield	14.		
Yellow Potato	15.		
Extra White Pearl	20.4		
Yellow Bermuda	39.5		
White Bermuda	44.8		

These onions matured in late May when those not actually destroyed, and so not included in the above counts, all had some soft leaves.

Southern blight (Sclerotium Rolfsii) found on the garlic and a few onions on May 15.

Blackspot (Colletotrichum circinans) was found only on the yellow potato onion.

PARSLEY: Softrot (Sclerotinia sclerotiorum) caused about 15 per cent loss of plants on the Horticultural Farm in early March.

Rootknot (Heterodera marioni) was found on all of the plants.

GARDEN PEAS: Wilt (Bacterium pisi), foot-rot (Mycosphaerella pinodes), and leafspot (Ascochyta pisi) were severe in the Horticultural Farm variety test. The following percentages include dead or practically dead plants. It is difficult to separate the damage done by each organism. These figures were obtained on May 15 when most varieties were bearing.

Variety	Per Cent Loss	Variety	Per Cent Loss
Bliss Everbearing	5	Onward	25
Home Delight	10	Improved Telephone	30
Hastings Edible Pod	15	Tartarian	51
Sugar Pod	20	Drought Proof	52
Premium Gem	20	Worlds Record	54
Potlatch	21	Prosperity	90
Large White Marrowfat	21	Thomas Laxton	95
Burpee Fordhook	22	Hastings Early Bird	100
Improved Stratagem	23	John L.	100
Champion of England	24	Extra Early Surprise	100
Sugarstick	25		

A half-acre field planted after Austrian Winter peas nearly all died before bearing. The diseases carried over from the latter.

POTATO: Blackleg (Bacillus carotovorus) has been less general and less destructive this year than in several previous years. Potato fields inspected at Union, Lumpkin, Rabun, and Clarke Counties contained almost no blackleg. However, one or two small fields in Clarke ran 50 to 60 per cent loss.

Scurf (Corticium vagum). Certified Maine seed potatoes inspected before planting in the above counties all exhibited this black scurf but seed treatment with corrosive sublimate apparently destroyed it. In all fields where potatoes were planted for the first time I found no evidence of Rhizoctonia. In one field in Rabun County that had been in potatoes many times before, there was almost 100 per cent infection on the stem bases and on the harvested potatoes.

Early Blight (Alternaria solani) was not found in Union, Lumpkin, nor Rabun Counties. In Clarke County on the Horticultural Farm it defoliated the plants at a little past the blooming stage.

Late blight (Phytophthora infestans) has been again found only in Rabun County. It occurred last year on late potatoes on this farm, and this summer in one five-acre field the tops were destroyed before the potatoes were mature and the yield was reduced about 30 per cent.

Mild mosaic. In Clarke County many small fields and gardens showed as high as 75 per cent of this type of mosaic. These were invariably from non-certified potato stock.

Leaf roll. One field on the Horticultural Farm showed at least 90 per cent of this disease.

TOMATO: Damping-off (Corticium vagum and Botrytis cinerea). About 25 per cent of the plants two to three inches high in flats, died in an Athens greenhouse in early April.

The diseases listed below were found on plants from the tomato plant area near Tifton. No survey was made, however, so percentage losses cannot be given. The plants are grown in open fields and shipped to northern tomato regions during the latter part of May and June. The seed all comes from northern sources. Most of the growers follow State certification rules, the seed is treated, a three-year rotation is practiced, and Bordeaux spray is applied.

Foot-rot or collar-rot (Alternaria spp.). Most of this seemed to be Alternaria solani. Collar-rot is the most widespread and difficult disease to control on seedlings in this State. In one large field the brown basal lesions were found on almost every plant. Microscopic

examinations showed few spores, but much mycelium, but in culture the spores form copiously. It is hard to understand such widespread infection in the field when the spores are so rare. A probable explanation is that most of it came in or on the seed, and if so the seed treatments have not been effective.

A case found this summer in the mountains of Union County points to the seed as the carrier. One grower produced plants on contract for the T.V.A. counties in this region. The tomato plants were grown in the open on a knoll in a very isolated mountain valley. There was no water drainage nor air currents that could have come from infection centers. The land had been recently cleared and was still in stumps. The seed came in cellophane packets from a northern source and the packets were marked certified and treated. The plants were ready for shipping in early July when an inspection was made and practically every plant showed collar-rot.

It is possible that the mycelium of the fungus enters the seed during the fermentation process in use by northern canners.

Bacterial wilt (Bacterium solanacearum) was found in restricted areas around Tifton. Affected plants turn yellow and the stems, about halfway up, become soft and shrunken. Most of the infected parts seen this year were above the ground. Mature plants, definitely wilting, were sent in from Savannah. There are many other hosts commonly grown near both places.

Bacterial canker (Aplanobacter michiganense). Typical cankers were found on one lot of Tifton plants.

Southern blight (Sclerotium rolfsii) was found on several lots from Tifton.

Bacterial leafspot (Bacterium vesicatorium) produced very small spots on leaves of most of the plants examined. It was not serious.

SPINACH: Drop (Sclerotinia sclerotiorum). About 10 per cent of plants in a Clarke County field were destroyed in March.

Mosaic was very noticeable in late April in the same field and most of the plants were affected. (Oct. 12)

OCCURRENCE OF TOBACCO BLACKSHANK IN TENNESSEE

Paul R. Miller

A tobacco wilt observed in a field near Adams, Tennessee by Mr. L. F. Mandelson of Australia and the writer on August 15, was thought at the time to be very similar to blackshank. Due to the comparatively poor condition of the specimens when examined by C. D. Sherbakoff and by R. F. Poole, the organism could not be identified with certainty and the disease was, therefore, reported as of undetermined cause (P. D. R. 19, p. 240, September 15, 1935).

Because of the importance of the possibility that the disease was blackshank, the writer, accompanied by Mr. J. K. Underwood, made another trip to this field. This time more than fifty affected stalks in excellent condition were collected and submitted to Doctor Sherbakoff, who found that every specimen showed definite symptoms of blackshank and when cultured produced a Phytophthora morphologically identical with the blackshank organism, P. nicotianae. Some of the specimens were sent also to E. E. Clayton, R. F. Poole, and W. B. Tisdale. No reply has been received as yet from Doctor Poole. Those of Doctor Clayton and Doctor Tisdale in general confirmed our finding that the disease is blackshank. This is, apparently, the first authentic report of the occurrence of tobacco blackshank in Tennessee.

The field in which blackshank was found was on soil of the clay loam type and had received applications of manure and 200 pounds of bone meal to the acre. It had been in alfalfa the previous season. It contained some twenty acres of the Medol variety--a dark-fired tobacco--of which about two acres were badly diseased in two definite, slightly depressed spots. There were also many individual diseased plants scattered throughout the entire field. The question is raised, where did the disease come from? In this connection, it should be stated that no diseased plants were found in any of the other five fields set with plants from the same plant bed. The weather record at Clarksville revealed nothing abnormal so far as temperature or rainfall were concerned.

DISEASES OF NUT CROPS IN THE PACIFIC NORTHWEST IN 1935

Paul W. Miller

WALNUT BACTERIOSIS IN OREGON: Walnut bacteriosis, due to Phytomonas juglandis (Pierce) Bergey et al, is present in only very limited amounts this year in most localities in Oregon. Losses from this disease vary according to the locality from a negligible amount up to 35 per cent. In the vicinity of Sheridan, Oregon, relatively

heavy losses estimated at about 35 per cent of the crop have occurred from blight infection. However, for the State as a whole, it is estimated that not more than 3 per cent of the 1935 Oregon walnut crop was destroyed by this disease. This is one of the smallest crop losses from walnut blight on record.

DROUGHT INJURY TO WALNUTS IN OREGON: The prolonged drought of the current growing season has adversely affected the quality of the Oregon walnut crop. Indications point to the fact that there will be a sizable percentage of partially to completely shriveled nuts in the 1935 crop. The drought has likewise resulted in premature yellowing and dropping of many leaves, particularly in orchards on marginal land with a low available soil moisture content.

LEAF "SCORCH" OF WALNUTS IN OREGON: Leaf "scorch", a non-parasitic leaf spot disorder of Persian walnuts, is quite prevalent this season in practically all walnut growing districts in Oregon. In some regions, however--notably in the vicinity of Sheridan, Oregon--it is so abundant that it has resulted in an appreciable decrease in the functional leaf area. This leaf spot disorder seems to be particularly severe in orchards on marginal soil types which are ill-adapted to walnut culture. Such soils are characterized, in the main, either by a lack of sufficient porosity, particularly at deeper lying soil levels, or by a relatively high water table during the winter months.

SUNSCALD OF WALNUTS IN THE PACIFIC NORTHWEST: There is an abnormal amount of injury to walnuts from sunburn in the Pacific Northwest this year. This situation appears to be due to the excessively high temperatures which occurred, in Oregon and Washington, during the growing season. It is conservatively estimated that a loss of at least 5 per cent of the crop has occurred from the injurious effects of the abnormal heat. Furthermore, the quality of the crop has likewise been adversely affected, as is shown by an increase in the amount of amber or dark-skinned meats and in the percentage of meats containing small brown spots in the skins. There is some observational evidence to indicate that the moisture content of the soil has had some bearing on the amount of damage sustained from sunburn, for orchards located on soils low in available soil moisture have, in general, sustained the greatest injury from this cause.

FILBERT "SHRIVEL" IN THE PACIFIC NORTHWEST: Filbert "shrivel," a disorder of the nuts which results in the failure of the embryo to develop, is present this season in varying amounts in practically all filbert orchards in the Pacific Northwest. While it is present in greater or less amounts in all varieties grown in Oregon and Washington, it is particularly prevalent in the Barcelona variety. In certain Barcelona plantings it is estimated that approximately 35 per cent of the crop is affected with shrivel and will be blank nuts at maturity. However, for the Pacific Northwest as a whole, it is estimated that not more than 15 per cent of the 1935 filbert crop will be lost from this cause. The exact cause of shrivel has not been definitely determined but it appears to be of non-parasitic origin.

BACTERIAL BLIGHT OF FILBERTS IN THE PACIFIC NORTHWEST: Bacterial blight of filberts, due to Bacterium sp., is present this season in many filbert plantings in Washington and Oregon. It is more widespread and destructive this season than it has been for some years past. Many young trees, two to three years of age, have died during the current season from bacterial blight infection. In some young plantings from 10 to 15 per cent of the trees have succumbed from the effects of the disease. Furthermore, trees in older plantings, ranging from five to fifteen years of age, have also been attacked by bacterial blight during the season just past. In one mixed eight-year-old planting of Barcelona and DuChilly filberts located near Chehalis, Washington, it is estimated that at least 75 per cent of the trees are infected to a greater or less extent. While the disease has not killed many trees more than four years of age, it has attacked and killed many buds and smaller twigs in the tree tops. Although bacterial blight does not attack the nuts directly, an indirect reduction in the crop has occurred in some plantings as a result of the death of many pistillate-flower bearing buds and smaller twigs which contained nut clusters. One grower near Chehalis, Washington, estimates that bacterial blight has reduced his crop by at least one-fourth.

FILBERT MILDEW IN OREGON: Filbert mildew, due to Phyllactinia corylea (Pers.) Karst., is present in limited amounts in filbert plantings in western Oregon. In general, however, it is not as prevalent as in 1934. Leaves infected with mildew do not seem to be suffering acutely from the disease as they are still dark green in color and are persisting on the trees. It is thought that the lateness of the attack is probably responsible for the small amount of damage that has occurred.

FILBERT BROWN-STAIN IN THE PACIFIC NORTHWEST: Filbert brown-stain, a non-parasitic disorder of the nuts, is present in limited amounts this year in a number of Barcelona filbert orchards in the Pacific Northwest. Losses from this trouble vary, according to the locality, from less than 1 up to 10 per cent of the crop. In most plantings, however, not more than 5 per cent of the crop is affected. In the aggregate, losses from this trouble will not exceed 2 per cent of the current crop. One of the interesting things about this trouble is that it is confined almost exclusively to the Barcelona variety. The DuChilly, Daviana, and Brixnut varieties are practically free from brown-stain. Just why this should be is not definitely known. The fact that these varieties are from two weeks to three weeks later than the Barcelona may or may not be significant.

SUNSCALD OF FILBERTS IN THE PACIFIC NORTHWEST: The abnormally high temperatures which have occurred in Oregon and Washington during July and August of the current season have been responsible for the death of many young filbert trees, one to two years of age. This is particularly true in orchards where the trees were headed high when planted and where no attempt was made to shade the tender bark of the

trunks by Yucca boards, newspaper mats, or some type of trunk protector. Large cankers developed in the bark of the trunk at or near the ground line on the southwest side. In severe cases, the bark completely encircling the trunk was killed and the tree subsequently died. In many instances the leaves were also adversely affected by the excessively high temperatures. Some of the affected leaves died while in others the functional area was reduced considerably by the death of the tissues at the margins. Those orchards which are located on marginal land or on soil low in moisture content appear to have sustained the greatest amount of damage from sunscald.

DROUGHT INJURY TO FILBERTS IN OREGON: The prolonged drought in Oregon during the current season has apparently adversely affected the filling of the nuts. It is apparent that there will be a considerable percentage of poorly filled or partially shriveled nuts in the filbert crop this year in the Pacific Northwest. This is particularly true of filbert orchards on soils low in available moisture. (Division of Fruit and Vegetable Crops and Diseases, September 20).

SEPTEMBER WEATHER

According to the Weekly Weather and Crop Bulletin for the week ending October 8, September mean temperatures were near normal, mostly slightly above, over the greater part of the country, with only a limited area in the Northeast and Southwest showing subnormal conditions. Between the Rocky Mountains and Pacific districts the month was abnormally warm, the plus departures over the central and northern Great Basin amounting to from 5° to as much as 7°. From the Lake region eastward and Maryland northward the temperature averaged mostly from 2° to 3° below normal and from Texas westward similar conditions obtained.

Figure 54 shows the percentage of normal precipitation by States, for September. The map shows that rainfall was above normal east of the Alleghenies and in Kansas, Colorado, Louisiana, Texas, New Mexico and Arizona. Throughout the rest of the country September was a dry month. The deficiencies in some States were very marked. Mississippi, Minnesota, North and South Dakota, Montana, Idaho, Utah, Nevada, California, and Oregon received less than half the normal rainfall. The map does not indicate the actual conditions in many States. The western halves of Kansas and of Colorado were drier than normal, the excess in precipitation being confined to the eastern parts of both States. Western Georgia, the Texas panhandle, and the northern parts of New Mexico and Arizona also received less than the usual amount of rainfall.

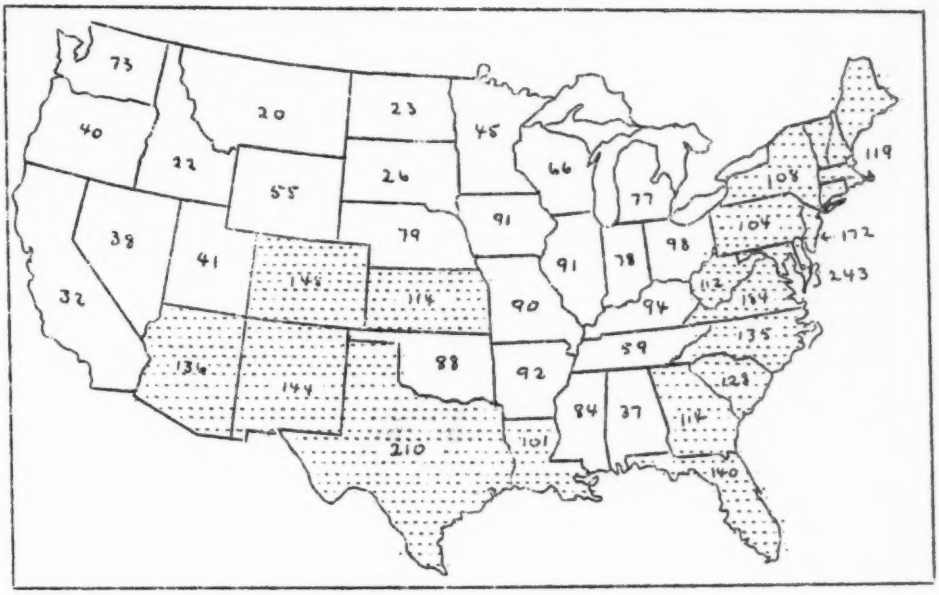

Figure 54. Percentage of normal precipitation for September, 1935. Shaded, above normal.